

This invention provides a system for controlling the phenotypic characteristics of cells. A pair of chimeric polypeptides is anchored in the plasma membrane, each of which has a variable region sequence and an effector sequence. The polypeptides are independent in the absence of antigen, but form a stable complex with each other when antigen is provided. This drives the effector sequences together in a manner that produces a receptor activation signal, leading to a phenotypic change. By titrating the amount of antigen present in the environment, the degree of phenotypic change can be regulated. Cells bearing chimeric polypeptides can be used to measure the concentration of antigen or select cells transfected with a therapeutic gene. The chimeric polypeptides can be used as a switch to turn on and off characteristics such as proliferation, apoptosis, degranulation, and protein synthesis, or to target cytolytic cells to antigen-bearing targets.